

T. A. EDISON.

APPARATUS FOR PRODUCING RUBBER STRIPS.

APPLICATION FILED JULY 1, 1910.

1,050,436.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.

Fig. 1

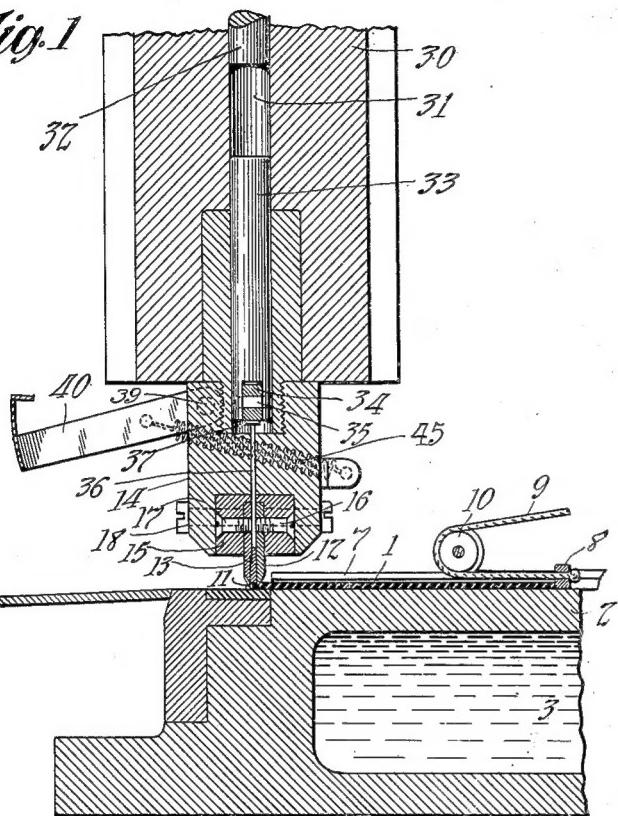


Fig. 3

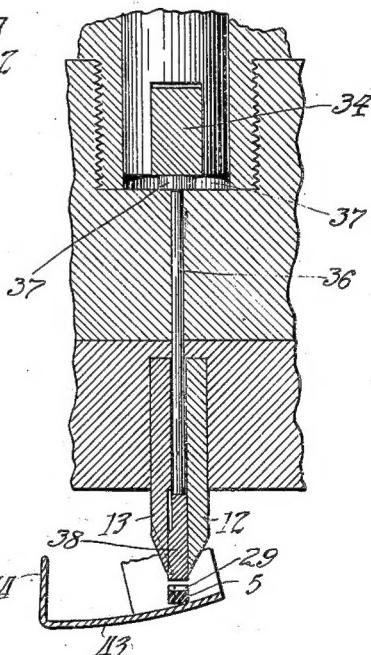
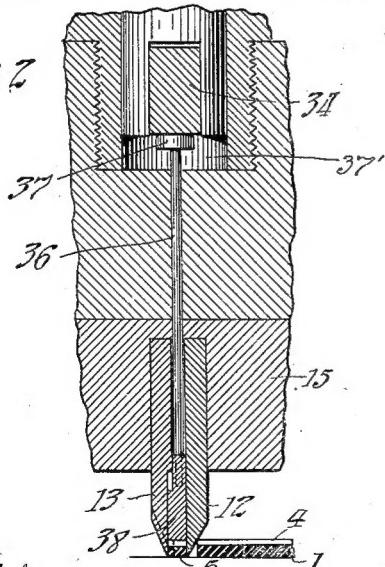


Fig. 2



Witnesses:

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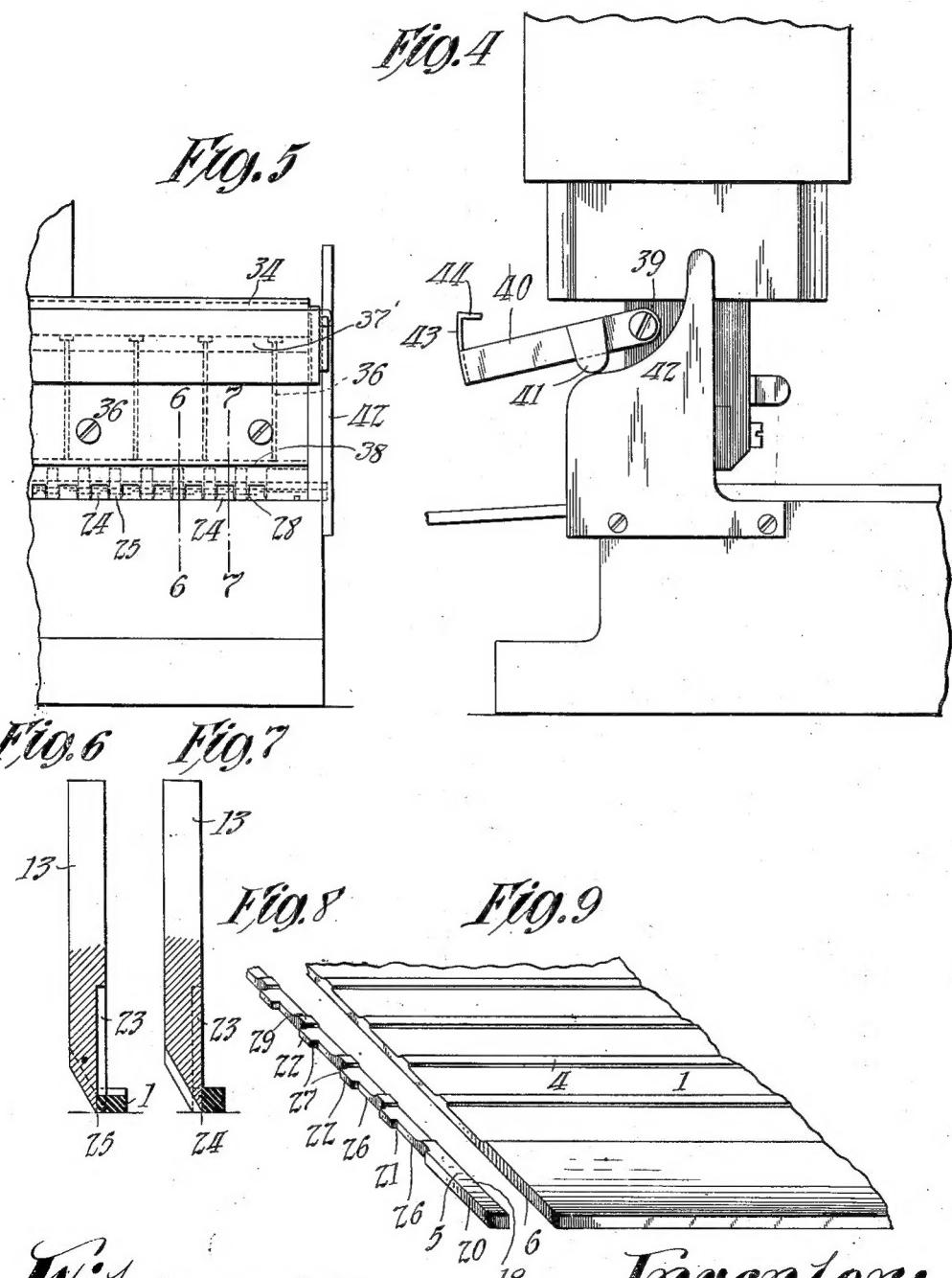
Thomas A. Edison
by Frank T. Rose
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¹⁹
Inventor:
Thomas A. Edison
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UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, WEST ORANGE, NEW JERSEY, ASSIGNOR
TO EDISON STORAGE BATTERY COMPANY, OF WEST ORANGE, NEW JERSEY, A COR-
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APPARATUS FOR PRODUCING RUBBER STRIPS.

1,050,436.

Specification of Letters Patent. Patented Jan. 14, 1913.

Application filed July 1, 1910. Serial No. 569,847.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, West Orange, Essex county, New Jersey, have invented a certain new and useful Apparatus for Producing Rubber Strips, of which the following is a description.

My invention relates to apparatus by means of which strips of hard rubber or similar material, preferably rectangular in cross section, may be rapidly and cheaply produced from long continuous sheets of such material. Such strips as those referred to are useful for a number of purposes, but more particularly for separating adjacent plates of opposite polarity in storage batteries.

My invention is an improvement upon the apparatus described and claimed in Patent No. 850,485, granted April 16, 1907, to John F. Ott.

The strips produced by my improved apparatus are described and claimed in my Patent No. 1,012,828 for improvements in storage batteries, granted December 26, 1911. The strips described in my said patent are of rectangular cross section and have lugs or projections formed on two adjacent sides, whereby the active elements of a storage battery of the class described in my said patent may be separated, while at the same time free circulation of the electrolyte in the battery is permitted and the effective working of the active surfaces of the electrodes interfered with as little as possible. The projections formed upon the two sides of each strip contact the adjacent surfaces of the tubular positive containers and the diagonally opposite edge of the strip contacts the adjacent flat pocket of the negative grid of a battery of the class described in my said patent.

The object of my invention, accordingly, is to produce mechanism for simply, cheaply and continuously producing strips of the character described.

Other objects of my invention reside in the combinations of parts and construction of elements hereinafter more particularly described and claimed in the appended claims.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings,

forming part of this specification, and in which corresponding parts are denoted by the same reference characters.

In the drawings, Figure 1 represents a partial vertical section through a machine embodying my invention. Fig. 2 represents an enlarged view of a portion of the mechanism shown in Fig. 1, in section, showing the cutting knives in the act of cutting a strip from the forward edge of a continuous sheet of the material. Fig. 3 is a similar view showing the knives at the top of their stroke and the cut strip being expelled from between the same. Fig. 4 represents a partial side elevation and Fig. 5 a partial end elevation of the machine. Figs. 6 and 7 are sections taken on line 6—6 and 7—7 respectively of Fig. 5. Fig. 8 is a perspective view showing the form of a strip cut by the mechanism illustrated in the preceding figures; and Fig. 9 represents in perspective a sheet of hard rubber or similar material from which the strip shown in Fig. 8 has been cut.

Referring to the drawings, the sheet of hard rubber or other desired insulating material 1 is supported by table 2 which is preferably heated by steam chamber 3, as described in patent to Ott referred to, for softening the rubber sufficiently to permit of the same being cut. The sheet 1 is provided with parallel ridges 4 as illustrated upon one surface of the same. The sheet 1 is fed forward along table 2 to the cutting knives to be described so that strips such as 5 may be cut from the forward edge 6 of sheet 1 at right angles to the ridges 4 on said sheet. A board or plate 7 is preferably laid upon sheet 1 as described in the patent to Ott referred to to prevent bending or buckling of the sheet and also to act as a blanket for the material which is to be cut, so that it remains in a warm and soft condition for being operated upon. The sheet may be fed forwardly by means of the block 8 which presses against the rear edge of the sheet 1 and rope or wire 9 passing over pulley 10. Rope 9 preferably passes over another pulley, not shown, beyond which it hangs vertically and has a weight attached thereto, as described in said patent of Ott, the weight acting through the rope and connections to constantly force sheet 1 forwardly. The forward edge of the sheet 1 is held in the

proper position to be cut by pin 11. When a strip has been cut from the forward edge of the sheet, the same is removed by means to be described, whereupon the newly formed forward edge of sheet 1 is immediately forced forward by the feeding mechanism described into contact with pin 11 in proper position for the cutting of the next strip upon the next descent of the cutters. Cutters or knives 12 and 13 are mounted in the plunger or head 14 by any suitable means, as the block 15, within which the knives may be secured as by screws 16 and 17, the block 15 being secured within head 14 by any suitable means as the bolt 18. Head 14 is adapted to be reciprocated vertically during the cutting operation.

When cutters 12 and 13 descend, the rear cutter 12 severs the strip from the sheet forming the plane surface 19 upon the rear side of strip 5, as shown in Fig. 8. The forward cutter 13 cuts out portions of the material from the front edge 20 of the strip as shown at 21 to leave projections or lugs 22 upon the forward edge 20 between the cut-away portions. Cutter 13 is accordingly recessed at intervals as shown at 23, so that it is formed with parallel cutting edges 24 and 25 arranged alternately, edges 24 cutting the surfaces 26 of the cut-away portions 21 between the lugs 22 and cutting edges 25, passing along the front edges of lugs 22. The end surfaces 27 of lugs 22 are cut by portions 28 of cutter 13 at right angles to edges 24 and 25. Since sheet 1 has corrugations or ridges 4 formed upon the upper surface thereof, it is evident that the operation described results in the formation of strips such as 5 having lugs 22 upon the forward surface thereof and lugs 29 upon the upper surface thereof.

When cutters 12 and 13 rise after the cutting operation, a strip such as 5 is held between the cutting edges of knives 12 and 13 and rises with the same, sheet 1 moving forwardly so that its newly severed forward edge 6 contacts pin 11 in position for the cutting of the next strip. At the end of the upward movement of head 14, the strip 5 is ejected from between knives 12 and 13 and removed out of the path of the cutters 12 and 13 by means now to be described. Head 14 is fixed within reciprocating plunger 30 within which is a central vertical passage 31 within which the stationary stop 32 is positioned. Rod 33 is positioned below stop 32 within passage 31 within which it slides. Horizontal member 34 is secured within the lower end of rod 33 by suitable means such as screws or pins 35. Vertical pins 36 are slidably mounted at intervals in vertical openings in the head 14, with heads 37 upon their upper ends located in horizontal passageway 37' within head 14 just below horizontal member 34, which is supported by the

heads 37, the under sides of which rest upon the bottom of passageway 37' when pins 36 are in their lower position. The lower ends of pins 36 extend downwardly between cutters 12 and 13, where they are secured to a horizontal member 38 which extends between cutters 12 and 13 below pins 36. When the knives 12 and 13 are at the bottom of their stroke in cutting off a strip, as shown in Fig. 2, the lower surface of strip 38 is in contact with the upper surface of the rubber strip held between the lower ends of knives 12 and 13, as shown in Fig. 2, this contact causing member 38 and pins 36 to rise somewhat, as shown in said figure. When the head 14 rises, rod 33 moves therewith, being held up by the member 38 resting upon rubber strip 5 between knives 12 and 13, until its upper end contacts the lower surface of stop 32, when rod 33 is forced downwardly relatively to plunger 30 a sufficient distance to force pins 36 and member 38 downwardly through the spaces provided therefor between knives 12 and 13 to force the strip 5 out of the lower ends of knives 12 and 13 as shown in Fig. 3, when the lower surfaces of heads 37 of pins 36 contact the bottom of passage 37'. Head 14 of the reciprocating plunger has pivoted thereto at 39 an arm 40 carrying a rounded lug 41 which coacts with a cam 42 upon the side of the machine. At the free end of arm 40 is provided a plate 43 having one end thereof preferably bent at an angle thereto as shown at 44. As the pivot 39 of arm 40 rises and falls with the movement of head 14, lug 41 rides upon cam 42 and arm 40 swings from the position shown in Fig. 4 when the knives are in their lowest position and plate 43 is substantially vertical to the position shown in Fig. 3, in which the knives are in their upper position and plate 43 is substantially horizontal, arm 40 accordingly being in a nearly vertical position. When the knives are in their upper position, plate 43 is immediately below the same and catches the strip ejected from between the knives by pins 38. As the knives descend for the next cutting stroke, arm 40 rises to move plate 43 out of the path of the descending knives and to dump the cut strip upon a suitable receptacle to the left of the machine as viewed in Fig. 4. Spring 45 attached to arm 40 and head 14 causes lug 41 always to remain in contact with cam 42.

It will be understood that my invention is not limited to the exact details described, but that various departures from the specific form of apparatus described may be made within the language of the appended claims and without departing from the spirit of my invention.

Having now described my invention, what I claim is:

1. In apparatus of the character de-

- scribed, in combination, means for supporting a sheet of the material to be cut, means for simultaneously cutting strips of material from the said sheet and removing portions of material from one edge of the strip so as to form lugs or projections on the said edge, and means for advancing the sheet a predetermined distance between cutting operations in a direction substantially at right angles to the edge from which the strips are cut, substantially as described.
2. In apparatus of the character described, in combination, means for supporting a sheet of the material to be cut, means for cutting said material in strips having lugs or projections on one of the cut edges, and means for feeding the material to the cutting means in a direction substantially at right angles to the edge from which the strips are cut, substantially as described.
3. In apparatus of the character described, in combination, means for supporting a sheet of the material to be cut and for heating the material to soften the same, simultaneously operating parallel cutters for cutting said material in strips having lugs or projections on one of the cut edges, means for feeding the sheet to the cutters, and means for preventing buckling of the softened sheet, substantially as described.
4. In an apparatus of the character described, in combination, means for supporting a sheet of the material to be cut, parallel cutters for cutting said material in strips having lugs or projections on one of the cutting edges, and means for feeding the material in a direction substantially at right angles to the cutters, substantially as described.
5. In an apparatus of the character described, in combination, a table, means for feeding a sheet of the material to be cut along said table, and reciprocating knives for cutting strips from the forward edge of said sheet, said knives being arranged to cut away portions of the material from one edge of each strip as it is cut, and to leave projections along said edge between the portions cut away, substantially as described.
6. In an apparatus of the character described, in combination, a heated table, means for feeding a sheet of the material to be cut along said table, and reciprocating knives for cutting strips from the forward edge of said sheet, said knives being ar-

ranged to cut away portions of the material from one edge of each strip as it is cut, to leave projections along said edge between the portions cut away, substantially as described. 60

7. In an apparatus of the character described, in combination, a table, means for feeding a sheet of the material to be cut along said table, and reciprocating parallel knives for cutting out portions of the advanced edge of said sheet to leave projections along said edge between the cut away portions, and for cutting said sheet along a line parallel to said edge to separate the strips from the sheet, substantially as described. 65

8. In an apparatus of the character described, in combination, a table, means for feeding a sheet of the material to be cut along said table, reciprocating parallel knives for cutting strips from the forward edge of said sheet, and means for disengaging the cut strips from the knives on the upward strokes of the knives, substantially as described. 70

9. In an apparatus of the character described, in combination, a table, means for feeding a sheet of the material to be cut along said table, reciprocating parallel knives for cutting strips from the forward edge of said sheet, a member located between said knives, and means for moving said member downwardly relatively to said knives on the upward strokes of the latter to force the cut strips out from between 75 said knives, substantially as described. 80

10. In an apparatus of the character described, in combination, a table, means for feeding a sheet of the material to be cut along said table, reciprocating parallel knives for cutting strips from the forward edge of said sheet, means for forcing the cut strips from between the knives on the upward strokes of the latter, and means for catching the strips as they fall from the 85 knives and removing them out of the path of the knives on the following down strokes, substantially as described. 90

This specification signed and witnessed this 30th day of June 1910.

THOS. A. EDISON.

Witnesses:

DYER SMITH,
FRANK D. LEWIS.

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